

We claim:

1. A method of determining in a volume of liquified gas in a cryogenic storage tank having a liquid space and a head space, comprising the steps of:

entering and storing the dimensions and orientation of the storage tank;

entering and storing the type of liquefied gas contained in said tank;

5 entering and storing a stratification coefficient;

storing a lookup table of conversion coefficients used to covert a head pressure value into an estimated average pressure value, said conversion coefficients being accessed according to the entered dimensions and orientation of the storage tank;

10 storing a lookup table of density constants, stored according to the estimated average pressure, and liquid type;

measuring the differential pressure between the liquid space and the head space;

measuring the pressure at the head space;

calculating an estimated average pressure using the measured head pressure and the stratification coefficient;

15 reading a liquid density value from a look-up table of density constants using the calculated estimated average pressure and the entered liquid type; and

computing in a liquid volume in said tank as a function of said differential pressure, liquid density tank dimensions, tank orientation, and type of liquefied gas.

2. The method of Claim 1, wherein the step of computing the liquid volume further comprises the step of displaying the liquid volume on a display.

3. The method of Claim 1, wherein the step of storing the dimensions of the storage tank comprises the step of storing a tank height and diameter.

4. The method of Claim 1, further comprising the steps of:
storing an alert volume; and
generating an alert signal if the calculated liquid volume is below the alert volume.

5. A system for displaying liquid volume of a cryogenic fluid stored in a cryogenic tank, the fluid stored within the tank, the tank containing a liquid space and a head space, the system comprising:

a differential pressure sensor coupled to the head space and to the liquid space for sensing

5 a differential pressure between the liquid space and head space and generating a differential pressure signal as a function of the differential pressure;

a pressure sensor coupled to the head space for sensing a pressure of the head space;

an operator input interface for entering the dimensions of the container and the type of cryogenic fluid;

10 a nonvolatile memory coupled to the operator input interface, for storing the dimensions of the tank, the type of cryogenic fluid, tank dimension formulas, a look-up table containing

liquid density conversion constants for each of plural tank dimensions, and a look-up table containing cryogenic fluid densities for each of plural liquid types and plural pressure ranges;

15 a micro-controller coupled to the pressure sensor, the differential pressure sensor and the nonvolatile memory, said micro-controller reading from said nonvolatile memory a selected liquid density conversion constant corresponding to said stored dimensions of the container;

20 said micro-controller calculating an estimated average pressure as a difference between said head space pressure and said liquid density conversion constant, and reading from said nonvolatile memory a selected liquid density corresponding to said estimated average pressure and said liquid type;

said micro-controller calculating a liquid volume based upon the dimensions of the tank, the type of cryogenic fluid, the tank dimension formulas, and the cryogenic fluid densities; and

a display coupled to the micro-controller for displaying the liquid volume.